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Country Practice.

It appears possible that the various new spheres for veterinary activity which have opened during the last few years, some of which are still likely to extend considerably, may cause the old field of country practice to be unduly neglected.

Indeed, it is not impossible that the supply of country practitioners may soon begin to fall short of the public requirements. The numbers of students entering the schools have of late decreased considerably. On the other hand, the Army and the Colonies absorb more of our young graduates than ever before, and there is no doubt that a large number of veterinary surgeons will soon be required for the Public Health Service at home. The number of young veterinary surgeons entering private practice is therefore falling off at present, and the decrease will be even more marked a very few years hence. There is, too, distinct evidence, among those young graduates who decide to practise privately, of a preference for such branches as canine practice, and a growing tendency to avoid the undeniably much rougher and harder work of the country veterinary surgeon.

These considerations suggest that a young graduate whose physique and temperament fit him for country practice may decide to follow it with little fear of finding the competition too keen. Undoubtedly there are disadvantages attached to the life of a country veterinary surgeon, but there are corresponding advantages which, to some men, more than outweigh the drawbacks. As regards the income to be expected, it is very questionable whether practice in the country, on the whole, is less profitable than that in large towns. A veterinary surgeon's income, whether in town or country, depends partly upon his own reputation, and partly upon the locality. There are many country districts in which veterinary practice will never be lucrative, but the same remark is perfectly true of not a few parts of London, which some seem to suppose the El Dorado of the veterinary surgeon. We know quite well that there are many veterinary surgeons making good incomes in country practice, and there is no reason why the number of these should diminish.

Some men are quite unadaptable to country practice. Some fail by attempting it without sufficient experience - for it is universally admitted that our Colleges do not supply all the practical knowledge necessary for work amongst farm stock. To those suited to it, and who have, or choose to acquire, the necessary experience, country practice, in a well selected district, will prove at least as profitable as either the public service or private practice in towns.

SENILE ENDO-METRITIS.

Since recording the three cases described under the heading of "Purulent Metritis" in your issue of May 30th, I have met with two others occurring in aged bitches, and on consulting former notes on similar cases I had previously encountered, have come to look upon it as a senile condition, occurring only in aged animals. The disease is an interesting one from the fact that no attention is given to it in text books, nor have I been able to discover any literature bearing on the subject. It is a much commoner condition than one would suppose, and often passes unrecognised: cases when presented for examination exhibiting marked gastric symptoms, so masking the real nature of the disease. Again, when the disease is more advanced it is frequently mistaken for dropsy of the abdomen, the two conditions being differentiated from one another by the fact that in the former the distension is confined to either side, the abdomen never becoming pendulous, and in very advanced cases where the emaciation is very great the outline of the distended uterine horns is plainly discernible on either side.

Respiration is seldom impeded, except in those cases where the accumulation is very great, and even then not to any great extent. Many cases present no untoward symptoms until the disease is advanced, these disappearing again on the escape from the uterus of the discharge, again re-appearing a month or two afterwards. All cases do not follow this rule, for it may continue for so long as ten months or more without evidence of any discharge until the gastric symptoms appear, the case becomes alarming, advice is sought, and relief afforded.

The nature of the discharge varies in character, depending upon the duration of the disease; in the early stages it is of a thin sanguineous character, at a later period becoming semi-purulent, whilst in protracted cases quite purulent, varying in consistency according to the length of time it has been retained, sometimes thin, at other times as thick as cream.

Both dogs and cats are susceptible to this morbid condition, appearing only in adult life, and then may be confounded with pregnancy. It may occur in animals that have never borne young, or it may appear a few months after parturition. All breeds of bitches are equally susceptible, but colour seems to be an especial feature in the cat, white cats being more prone to the disease. Its harmful effects are not so manifest in the cat, or the animal is more resistent, for treatment is not so often requisitioned until the disease is very far advanced, whilst they

do not so readily succumb to the toxic effect when absorption of the uterine contents takes place, many living years whilst affected with the disease. The animal to all appearances becoming pregnant, after a time passing a quantity of thick pus, when the distension subsides until a later period when those phenomena are again manifested. Nor is the systemic disturbance so great, gastric symptoms being only seldom displayed. Ultimately they succumb to a septic intoxication, invariably courting quiet by hiding away, loss of power comes on, inability to stand, they become comatose, and death ensues.

In the bitch periodical attacks of gastritis occur, which answers to general treatment. This I concluded must be due to reflex irritation from the uterus, and latterly due to absorption of the product when distension is most marked, for there is a cessation of these symptoms on its escape from the uterus. Depression is very marked at these periods, vomition frequent, with inability to retain food.

Death in a few cases may occur very suddenly in the bitch, due to small areas of the uterine walls becoming necrotic and sloughing out, allowing of the escape of this septic material into the peritoneal cavity, setting up peritonitis, both parietal and visceral, the animal appearing in fairly good health a short time prior to its demise.

Post-mortem examination reveals inflammation of the lining membrane of the uterine horns, the body appearing normal; this varies in degree in different cases. Sometimes the whole uterine wall is enormously thickened, at other times thinner than usual. The two horns are greatly distended, the os contracted, and the vagina free of any fluid and collapsed. Other cases show a perforation in one or other horn with total or partial escape of its contents, the latter varying in character according to the duration of the disease as described above. The stomach in most cases is in a state of catarrhal inflammation, occasionally phlegmonous in others.

Treatment.—The best is surgical treatment, consisting in performing excision of the uterus, but unfortunately when calling for treatment the animal is not in a fit condition for operation, so that one has to direct their attention to combating the gastric symptoms.

Bismuth chlorotone or other stomach sedatives afford temporary relief, limiting the diet to milk and enforcing quietude.

Placing the hinder parts of the animal in very warm or hot water greatly ameliorates the condition by relaxing the parts, often promoting the escape of some of the uterine contents.

Removal of the fluid by means of a catheter is not always practicable on account of the difficulty often experienced in its attempted passage through the os uteri. Where it is not too constricted this is a good method, followed by uterine antiseptic injections.

GEO. YATES.

The Royal Sanitary Institute.

At an Examination for Inspectors of Meat and Other Foods, held in Liverpool on May 1st and 2nd, 1908, 18 candidates presented themselves, seven candidates were awarded certificates, including Arthur Ellison, Harrogate; and Samuel Wharam, Leeds.

ASPERGILLOSIS.

It has long been known that certain moulds of the genus *Aspergillus*, whose natural habitat is upon dead organic matter, may invade the air passages of mammals, and especially of birds, and there occasion serious—generally fatal—disease. This disease, *Aspergillosis*, has been studied in solipeds, cattle, lambs, dogs, and human beings, but is especially common amongst birds. First discovered in 1815, in a jay, it has since been recognised in many species of birds, both wild and domestic—including fowls, geese, ducks, swans, pheasants, and pigeons. The usual seats of the disease are the trachea, bronchi, and lungs, and in birds the air sacs. Sometimes, though more rarely, it affects the nasal cavities, or, in birds, the air sinuses of the bones.

Four species of *Aspergilli* have been found as parasites, and of these *Aspergillus fumigatus* is the most dangerous, as the temperatures of animals and birds are more suitable to its development than to that of the other varieties. Aspergillosis causes clinical symptoms, and naked-eye post-mortem appearances very similar to those of tuberculosis, as the following details of a case in a parrot, just published in *The Archiv. Veterinara* by Prof. Pœnaru, of Bucharest, illustrate:—

The symptoms were as follows: the bird was depressed and somnolent, the wings drooping, and the plumage disordered; great thirst was present, but no appetite; the muscles were atrophied, the respirations accelerated, deep, sonorous, and very laboured; from time to time the beak was opened slightly; a serous discharge flowed from the nasal orifices. The temperature was from 104 to 106·7 F. and the heart very accelerated. Râles were heard upon auscultation, the excrements were diarrheic. These symptoms had been evident for about a month, but had become accentuated during the last two weeks, having been aggravated by a journey from Constantinople to Bucharest.

After death, post-mortem examination disclosed the lung to be the only viscera affected. It was infiltrated with nodules varying from the size of a millet seed to that of a pea, and tubercular in appearance. Some of the nodules were in the depth of the lung, others at its surface, forming adhesions between the lung and the chest wall; most of them were caseous, some calcareous, and others fibrous.

So far, both symptoms and post-mortem lesions altogether resembled those of tuberculosis. Upon section of a tubercle, however, a small greenish point might be seen about its centre.

Microscopic examination by the Ziehl method failed to reveal the tubercle bacillus; but preparations from the centre of the tubercles—especially from the greenish points—showed a quantity of spores and filaments. Sowing upon different nutritive media produced nearly pure cultures of the *Aspergillus fumigatus*, and the disease was reproduced in rabbits by intra-peritoneal inoculation.

Histological examination of tubercles (imbedded in celloidin before cutting) showed a multitude of spores and sporigenous filaments, which had in-

filtrated and destroyed the pulmonary vesicles, in the centre of the tubercles, with several layers of necrotic cells at the periphery.

Poenaru, while emphasising the similarity which aspergillosis of the parrot bears to tuberculosis, both in its clinical symptoms and its naked eye post-mortem lesions, suggests that the greenish colouration of the centre of the nodules may be a guide in distinguishing the former disease macroscopically. He also suggests that, in both animals and birds, an attempt should be made to diagnose the disease during life by a microscopic examination of the nasal discharge, which may contain spores and filaments.

Dieulafoy, Chantemesse, and Widal have diagnosed pulmonary aspergillosis in the human subject by microscopic examination of the sputa, which contained spores and filaments of *Aspergillus fumigatus*.

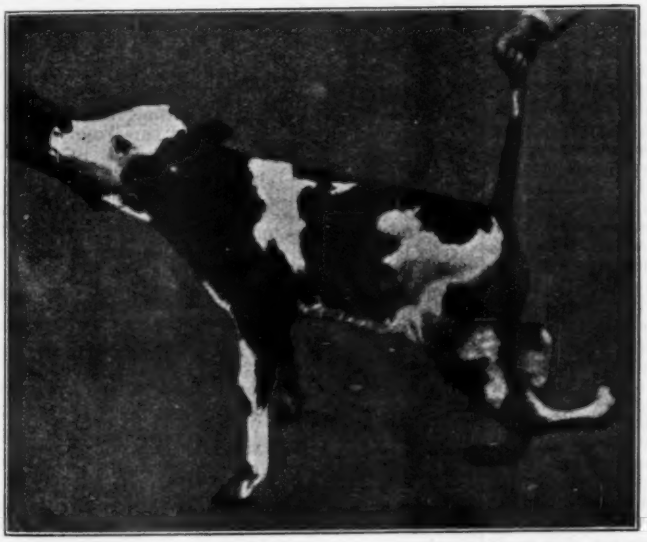
W. Roger Clarke.

ABSTRACTS FROM FOREIGN JOURNALS.

Supernumerary Limb in a Calf. By Veterinary Surgeon Mord, of Rastenburg.

The accompanying photograph shows the extra limb as an appendage from the kidney region and apparently growing from the spinal column.—Ex. *B.T.W.*

G. M.



Congenital Deformity.—By Veterinary Surgeon Friederich, of Hersfeld.

The accompanying photograph shows an interesting case of deformity of the limbs. The left hind limb from the hock forms a great curve round the right. The right hind foot shows strong dorsal flexion, so that the fetlock joint touches the ground. The calf was not able to stand on its hind legs. This deformity was doubtless congenital, but does not appear to have given trouble at calving time. —Ex. *Berliner Thier. Woch.*

G. M.

Equine Osteomalacia in Madagascar—Employment of Radiography.

M.M. Jaudran, Director the School of Medicine at Tanauarive, and Guilhem, second Veterinary Surgeon in Madagascar, have been studying equine osteomalacia. They believe the disease to be of infectious nature, but recognise a diet poor in lime phosphates as an *essential predisposing cause*. In their observations, they have made extensive use of radiography upon living horses affected with osteomalacia, and record their results in the *Revue Vétérinaire*.

From the radiographic figures reproduced by the authors, it appears that osteomalacia in horses attacks, in the first place, the periosteal and peripheral regions of the bone. The zones of decalcification present themselves, especially in the inferior maxilla, as irregularly outlined areas, quite different to, and of a much lighter shade than, the healthy maxilla. Pathological differences in density are clearly distinct, in radiographic figures, from physiological ones, such as that between the teeth and the tissues of the maxilla. Finally, the osteo-

malacic parts present a special spongy character, which is very visible upon certain radiographs.

The authors think that radiography has not previously been employed to investigate osteomalacia in Madagascar. It should be of great service in determining the precise extent of the disease in visibly affected horses, and may also be useful in making an early diagnosis, and thus avoiding the purchase of animals in the early stages, before osteomalacia is clinically evident.—(*Annales de Méd. Vét.*)

W. R. C.

DISEASES AND PARASITES OF OSTRICHES.

Like most animals, domestic and wild, the ostrich is subject to a number of diseases and to infection from several forms of internal and external parasites, particularly when young. Even if not fatal, many of these reduce the birds to such a degree that the feather production suffers greatly, and recovery is often very slow. In contrast to this susceptibility to parasites, it must be admitted that the ostrich possesses a remarkable power of recovery from injuries; he recovers from skin and flesh wounds and surgical operations in an astonishing manner; moreover, once he has got over the pitfalls of youth diseases give but little trouble

The wire-worm (*Strongylus Douglassi*), infesting the mucous membrane of the upper wall of the stomach, is unquestionably the greatest trouble of the ostrich farmer. Even where the birds are not decimated by it, they are often reduced to such a low condition that their feathers are almost valueless. It seems to be one of the principal causes of mortality among chicks, though the actual proof of this calls for more thorough investigation. Some farmers hold that no birds are altogether free from the parasite, and that it is only kept in check by maintaining the birds in excellent nutritive condition.

From the region at which the wire-worm infests the stomach and its strong power of resistance to the usual remedies, its destruction is particularly difficult. The Agricultural Department has already conducted many tests as to the best remedy against wire-worm, and the drastic carbolic acid treatment has been found satisfactory by many farmers. Some birds, however, require a year or two in which to completely recover from the attack, and entail much loss by the inferior quality of feather produced during the period. Experiments upon the life-history of the *Strongylus* are much needed, and, if the method of infection were known, this would probably be of some assistance in combating the trouble. The tape-worm, also very prevalent, does not appear to have a particularly harmful effect so long as the bird has plenty of good food. Moreover, it is easily kept in check by the regular dosing of the young birds with turpentine and other remedies, such as is carried out by many farmers.

In dissecting adult birds another worm is sometimes met with entwined in the mesentery and connective tissues outside the organs. Numbers of these of different sizes are found grouped together, some a foot or two in length and others only two or three inches. It is evidently an undescribed species of Nematode, and at an earlier stage occurs in large numbers in the intestine.

Yellow liver in chicks will probably be found to be due to the presence of some protozoan parasite, and researches in this direction are urgently needed.

A form of lamziekte is becoming somewhat prevalent in certain localities, and is under investigation.

Among external parasites much consideration has been given to the ostrich mite, *Pteroliches bicaudatus*, nearly always found along the inner groove of the shaft of the feather. Formerly much significance was attached to this parasite as a possible cause of the production of defects in feathers, but it is now shown so have probably little direct effect upon the bird or the feather. The parasite lives upon the dried pith or medulla of the feather from which the nutritive blood has receded, and thus confines itself to a part which is useless, and preened away as the plumes attain maturity. Perfect feathers are as likely to be infested with the mite as are very defective examples.

The ostrich louse and fly, though somewhat troublesome at times, do not seem to demand serious consideration. The wire-worm, tape-worm, and probable protozoan parasite of yellow liver are the ostrich pests most calling for study.

Investigations are showing that for perfect feather production the birds must be kept in as perfect a condition of health as possible, and experiments are now in progress as to the best foods and treatment for maintaining such a desirable condition. Though the digestive powers of the ostrich are proverbial, the bird under domestic conditions is by no means free from digestive troubles, and especially during a state of drought a knowledge of the best food is desirable.

Defects in Feathers.

Comparitively few ostrich feathers as clipped from the bird are altogether perfect, and hence command a much less price than would otherwise be the case, even though the defects can for the most part be remedied in the dressing of the feather. Frequently feathers are thin and narrow where they should be full and broad, this usually resulting from a lowered nutritive condition of the bird. The defects of greatest concern to the farmer are those technically known as "bars," and represent an imperfect formation of the plumes at more or less regular intervals. From the presence of these bars a clipping will frequently be worth from 25 to 50 per cent. less than if they were absent, a loss which represents many thousands of pounds annually to the farmer. The matter is one which has long called for investigation, and the writer has for some time been carrying out researches upon the subject on behalf of the Government of Cape Colony.

Similar defects are known to occur in practically all birds, though probably in none to the same degree as in the ostrich; moreover, bars are found in the plumes of the wild ostrich, as well as in those of the domesticated bird, and among the latter some are much more subject to them than others. Various explanations as to the cause of bars have been suggested, but when put to experimental test none is found to be at all adequate. An obvious explanation would be that they represent an impaired nutritive condition of the bird, hence the term "poverty bars" sometimes employed, and the first experiments were directed to prove or disprove this. It has now been shown that the defects are almost as likely to occur in birds highly fed as in those with enfeebled constitution; different strains vary much in the degree to which barring prevails. In some instances they have been proved to be produced by exposure to inclement weather, by constriction of the lip of the socket around the soft growing feather, but this is undoubtedly only an exceptional occurrence, and does not strike at the root of the matter.

The experiments and observations have proceeded so far that one can now safely say where the trouble lies and how the bars are produced, and at present others are being conducted with a view to determining a remedy.—*The Agricultural Journal* (Cape).

HORSE-POX DIRECTLY TRANSMITTED TO MAN.

By A. F. Cameron, M.A., M.D., D.P.H.

Senior Assistant Medical Officer, South-Eastern Fever Hospital; late Senior Assistant Medical Officer, Small Pox Receiving Station, Metropolitan Asylums Board.

During the small-pox epidemic in London in 1901-2 about 10,000 patients were re-examined at the receiving stations, and about 1,000 of these were found not to be suffering from small-p x. The cases included many of great interest and variety. The following is an account of one of the non-small-pox cases which deserves to be placed on record.

F. K., 32 years of age, a stableman, was admitted to the receiving station, South Wharf, Rotherhithe, on March 31st, 1902, certified to be suffering from sn all-pox.

Condition on Admission.

He complained chiefly of pain in the left arm and arm-pit. His temperature was 100·4 F., his pulse 100. He was at work up to March 25th, but first felt out of sorts on March 23rd, when he noticed two red spots on his left arm. These "spots" became painful and enlarged, and others appeared. At the time of admission the rash on which the diagnosis of small-pox had been based was confined to the arms and left hand. It consisted of only eight lesions, of which seven were on the left forearm and hand, and one was on the right arm just above the level of the bend of the elbow. There was severe lymphangitis of both arms, and the axillary glands on both sides, but particularly on the left, were much enlarged and very tender.

The lesions varied in size, but not in type. They resembled the lesions of a primary vaccination about the eighth or ninth day of its development, but they were more severe. The vesicular ring with turbid contents was well raised above the level of the surrounding skin on an indurated and tender base. Within the ring was a brownish-black, slightly depressed crust. In the larger lesions on the arms the diameter of the vesicular ring varied from 12 mm. to 9 mm. In two, situated one on the left forefinger, the other near the base of the left thumb, the vesicle was much smaller. In two to three days after admission the severe pain in the arms abated. The local indurations and lymphangitis gradually disappeared as the lesions crusted and the gland swelling subsided without suppuration. A point to be noted is that for several days the patient had severe constitutional disturbance.

The fact that the lesions were confined to the left arm and hand (there was only one on the right arm), their uniform type and synchronous development, and above all their resemblance to the lesions of a primary vaccination, suggested that they were due to inoculation.

History.

He stated that for some time before the onset of his illness he had been engaged in treating a horse suffering from "ulcers of the mouth and throat." The treatment consisted partly in washing out the mouth, and for the purpose he used an ordinary syringe. The horse's head was raised and held in the usual way. The man held the charged syringe in his left hand, while he pressed home the piston with the right. His left forearm and hand were fully exposed to the stream of fluid returning from the horse's mouth. His right hand and arm were out of the way of the return stream, and were exposed only to the fluid which might splash or trickle along the outside of the syringe. This appears to explain the severe affection of the left arm and the comparative immunity of the right. The attitude of the arms in using the syringe, and the man's habit of keeping his shirt-sleeves rolled above the elbow when at work, probably accounts for the grouping of the lesions below the elbow, and the complete immunity of the left upper arm.

The patient had been successfully vaccinated in infancy and not since. He was vaccinated at the receiving station on three occasions with lymph of two strains known to be potent, but on no occasion did any reaction follow.

Consideration of all the circumstances of the case led to the diagnosis of horse-pox.

From time to time, since Jenner's and Loy's work, other cases have been reported of the direct transmission of the disease to man from a horse suffering from "sore heels." Eighteen months after the occurrence of the case F. K, my attention was called to a similar case which had been reported to the Clinical Society of London by Mr. John Langton in 1877, a case indeed so similar, that the coloured plate which accompanies the report in volume x. of the *Clinical Society's Transactions*, might serve, but with slight alteration, for the case now recorded. In Mr. Langton's case, however, the horse from which the disease was contracted was "suffering from inflammation of the legs and cracked heels," and no eruption or ulceration in the mouth was noted. In the case here described the patient did not say that the horse was suffering from any other local condition of the nature of "sore heels" or "grease," but unfortunately the veterinary surgeon who was in attendance was unable to give any accurate information on this point.

Still it appears almost certain that the man derived the infection directly from the "ulcers" in the horse's mouth, so that the case resembles the one investigated by Bouley in 1863, and reported by him at the time to the French Academy of Medicine. Bouley was then engaged in experimenting on the possibility of trans mitting diseases of the horse to other animals by inoculation. His horse had pustules in the mouth but no eruption elsewhere, and at first he described the condition as an "aphthous stomatitis." By inoculation of the matter from the pustules he produced "true pustules of cow-pox," from which he subsequently inoculated an infant of 11 months. Bouley afterwards recognised that the condition in his horse was not an aphthous stomatitis, but that it was one of the possible local manifestations of the same horse disease as was dealt with by Jenner and Loy, and shown by the latter to be a constitutional disease.

I am indebted to Dr. W. M. C. Wanklyn for permission to publish the notes of F. K.— *The British Medical Journal.*

AGAR-AGAR.*

The first notice we have of agar in Europe is in a paper by Payen (*Comptes Rendus*, 49, 521) in 1859. He mentions that a seaweed was found in 1856 in China, of which a sample was sent to him for examination. The alga was *Gelideum corneum*, or what is known as agar-agar, and he gives a short account of the properties of a colloidal solution obtained by boiling it with water; also he gives an analysis of the substance. He also speaks of it as being the seaweed out of which gulls build their nests, and that it is the substance which is used by the Chinese in making "Birds' Nest Soup."

The first question is: "What is agar?" "To what class of substance does it belong?" It has been shown by Payen and Porumbaru that it does not contain nitrogen; therefore, it is not a proteid, peptone, or albumen,

* Extract from a paper by W. F. Cooper, B.A. Cantab., F.C.S., and W. H. Nuttall, F.I.C., F.C.S.

nor yet is it a proteoid or an albumenoid—*i.e.*, it is not a gelatin, nor a glue; it differs very materially from all these in its properties. It seems that it must be placed amongst the more complex carbohydrates, celluloses, starches and gums. On oxidation with nitric acid the two former yield oxalic acid, whereas the gums and agar-agar yield mucic acid. For this reason Allen classifies it as a gum. Senier also classifies it as a gum. It has been shown by Payen (*Jahresbericht*, 1859, 562) to be similar to, or to yield, pararabin, or beet-sugar gum. From its properties it appears that this is the correct group in which to put it, therefore, though in many of its properties it is anomalous.

As bought, it is in the form of long, translucent, stringy pieces, tough, dry, and hard. Soaked in water it swells up as do gelatin and the gums. The soaked substance dissolves in water when boiled, and then only slowly. Our method of dissolving it is to cut up the agar into small pieces, soak them in running water for some hours, then place in distilled water; heat the water until it boils, and continue the boiling for a quarter of an hour, stirring vigorously the whole time. If the boiling is not continued long enough two things will be noted, first, that the solution is lumpy—*i.e.*, that the agar has not dissolved completely—and, secondly, that it is more difficult to strain.

For bacteriological purposes the treatment at the Cambridge Laboratory is to soak the agar in a 1 per cent. solution of acetic acid for twenty-four hours, wash out the acid in running water, and dissolve up by boiling. We may mention in passing that the acid has no ill effect; we have treated several lots in a similar manner with good results, but the treatment seems to be unnecessary.

Having dissolved the agar we proceed to strain it, in order to retain solid impurities. This we do in practice through nainsook. The solution is then fairly clear, but contains a large quantity of peculiar, slightly opaque, specks, and is not quite transparent as gelatin is, but the solution can be made perfectly clear by filtering. At Cambridge it is filtered through a special paper in a large funnel, the whole being enclosed in a steam-jacketed chamber which keeps the agar hot. (The paper can be bought from any dealers in chemical apparatus.) We dissolve each gramme of air-dried agar in 50 mils of water, which make a 2 per cent. solution. This is then filtered at as high a temperature as possible through a hot Buchner funnel, using a pump, the flask being placed in hot water. Such a solution is quite clear and transparent. This forms the solution of gelose. Such a solution has the following properties, though in giving these we must note that the age of the seaweed seems to have some effect on the properties. Our results do not quite agree with those of earlier workers.

A solution of agar in water sets when cooled, the temperature at which it sets being about 33-35°. It sets very rapidly when cooled to the setting temperature, more rapidly than gelatin. The gelatinising property is very great; it is said to be ten times as great as gelatin. Stanford puts it down as eight times as great; Allen states that gelose will form a jelly with 500 times its own weight of water.

Peculiarly enough, and entirely different from gelatin, a solution of gelose can be boiled for a long time without becoming much less viscous. Indeed, we frequently evaporate a solution which is too weak by boiling until it is quite thick. We may boil some solutions for an hour or more. We found that after boiling for a quarter of an hour the agar solution was slightly less viscous, but that continued boiling, within reason, does not make much difference for practical work. The boiling solution must be vigorously stirred in order to prevent it from being burnt; if burnt it is quite useless, as it produces a very dirty colour. This peculiarity is of importance. Gelatin is a nitrogen compound, and when hydrolysed by boiling or by heating with acids or alkalies it forms various compounds, amongst which are leucine and glycocoll and ammonia. Agar cannot form such compounds, though it may form aldose compounds. If heated with water under pressure, gelose is hydrolysed and yields a sugar.—*Pharmaceutical Journal.*

LIVERPOOL UNIVERSITY VETERINARY MEDICAL SOCIETY.

A general meeting was held in the Physiological Theatre of the University, on Monday, 18th May. There were present the following members: Messrs. Barron, Brooksbanks, Cockburn, F. G. Edwards, Hughes, Jackson, J. H. Locke, Matheson, Mattinson, Maguire, Price, Richardson, Stent, Storrar, J. Sumner, H. Sumner, Walker, Watson, Prof. Williams, Wolstenholme, E. Wood, and the Secretary, together with about twenty students and other visitors.

The minutes of the last meeting were taken as read.

Apologies for absence were received from Prof. Annett, Messrs. Faulkner and Taylor.

Mr. J. B. Wolstenholme was unanimously elected President of the Society for the present year.

The SECRETARY having intimated his desire to retire, it was agreed that Prof. Annett and Mr. Arnold Richardson, be appointed Joint Secretaries, Prof. Annett to undertake the duties of Pathological Secretary, and Mr. Richardson those of General Secretary in addition to the duties of treasurer.

It was proposed by Mr H. Sumner, seconded by Mr. J. Sumner, and carried, that the Society accepts with regret the resignation of the Secretary, and records its appreciation of his services on behalf of the Society during the three and a half years he has held the secretaryship.

Messrs. J. Sumner and Share-Jones were elected auditors.

Mr. A. B. MATTINSON, M.R.C.V.S., was unanimously elected a member of the Society.

The report of the Mutual Defence Society was laid before the meeting, and Mr. H. Sumner pointed out the advantages of the Society and urged those present to become members.

GASTRIC AFFECTIONS OF THE HORSE.

By E. WALLIS HOARE, F.R.C.V.S.

Mr. President and Gentlemen,—In this age, when new discoveries are the order of the day, when bacteriological and pothological science engrosses so many minds and appears at times to usurp the province of clinical medicine, and withdraw the interests of practitioners from those diseases met with in the routine of daily work, my choice of a subject may be criticised unfavourably. Nevertheless, there are many subjects which although common-place in character still afford interesting points for discussion, and there are few diseases indeed concerning which there is not something to learn with reference to etiology, diagnosis, prevention, and treatment. And, although I have no discovery to unfold, no new ideas to disclose, and no novel theories to advance, I venture to hope that by introducing some debatable points in connection with the subject, and some problem that requires solution, I may succeed in starting a discussion which will prove beneficial to all concerned.

Gastric affections in the horse present many points of interest to the clinician; their diagnosis is attended with considerable difficulty and uncertainty, and, as a result their treatment is very often unsatisfactory. Again, many of them prove very fatal in spite of every form of treatment.

It is generally believed that the stomach of the horse is not so frequently the seat of disease as the intestines, and certainly the evidence afforded by autopsies tends to support this view. But at the same time there is the probability that many cases of gastric affections are not diagnosed, but are ascribed to intestinal affections and treated as such, and this is not surprising, considering the similarity of the symptoms that are often presented. Attempts have been made from time to time to lay down diagnostic symptoms for affections of the stomach, and, although there are certain diseases of the organ in which striking symptoms are very often present, we frequently find that if we attempt to verify our opinions by the performance of autopsies, our faith in diagnostic symptoms will be considerably shaken.

Of course in cases that recover it is very easy to assert that in one instance it was an affection of the stomach, and in another an intestinal disorder, and, considering the natural tendency to recovery, the apparent success of the treatment adopted does not really prove the diagnosis to have been correct.

A comparison of symptoms and post-mortem appearances is the only rational method by which the diagnosis of these affections can be placed on anything like a sound basis, and a comparison of the experiences of practitioners will prove extremely useful in this respect.

Before proceeding to consider the various affections of the stomach it will be of advantage to briefly draw attention to some of the physiological peculiarities of this organ in the horse, as these will to a certain extent assist in explaining some of the morbid phenomena met with. The information on these points I have taken from General F. Smith's "Veterinary Physiology," and I may remark that we are greatly indebted to the author of this valuable work for the careful experiments he has conducted, and the clear, lucid manner in which he has dealt with the physiology of digestion in the horse.

Amongst the anatomical and physiological peculiarities of the equine stomach the following merit attention.

(1) The small size of the organ, its capacity being, according to Colin, from 25 to 30 pints when distended, also only a portion of its internal surface being capable of secreting a digestive fluid.

(2) Its position—it is not in contact with the abdominal walls but rests in the large colon.

(3) Its inlet and outlet are situated close together.

(4) Its cardiac end being tightly contracted, and the special arrangement of the muscular fibres where the œsophagus enters—the œsophagus for several inches before entering the stomach being increased in thickness and contracted.

(5) The pyloric orifice being usually large and open, and the presence of a distinct pyloric ring, posterior to which the duodenum is dilated and arranged in a curved manner, resembling a well known trap used in drainage. This is termed by Smith "The Syphon Trap of the Duodenum," and he believes its function to be the regulation of the passage of ingesta from the stomach to the intestine.

(6) The difficulty in obtaining an empty stomach in the horse, experiments proving that even after 18 hours fasting some food is still present in the organ.

(7) During feeding, the stomach commences to pass out a portion of its contents into the intestine, but as more food is taken the process becomes slower and the organ becomes gradually full of ingesta. If still more food be taken, the amount passing out will equal that taken in. So that during feeding the stomach may allow two or three times the bulk of ingesta to pass out to that which remains in it when the feed is finished.

As soon as the feed is finished the process of digestion is very slow and occurs so gradually that a very long time expires before the organ becomes empty. The period at which digestion is most active is when the stomach is two-thirds full, of course this process of gastric digestion depends on the nature, form, quantity, and order of foods in feeding, and also on whether water be given before or after feeding.

According to Ellenberger, digestion is at its height in three or four hours after a moderate feed, in six or eight hours after a full feed, but after an immoderate feed it may be delayed still longer. The older writers erroneously held that gastric digestion in the horse was rapid.

(8) The experiments of Colin conducted with strychnine, would indicate that no absorption occurs from the stomach of the horse. In cases of paralysis of the gastric walls such as occurs in distention of this organ with ingesta or gases, we know from experience that large doses of medicinal agents produce no effect, as they do not pass into the intestine; this fact would tend to support the view of Colin on the question of absorption from the gastric mucous membrane.

(9) The absence of vomition in the horse under ordinary circumstances is a point on which many different explanations have been advanced. According to Smith the explanation is most likely to be found in the arrangement of the œsophagus at its termination, in the contracted cardiac end of the stomach, and the special arrangement of the muscular fibres at the part. Dilatation of the cardiac end of the stomach and of the œsophagus is essential to the act of vomition. Vomiting may occur either prior to or after the occurrence of rupture of the stomach, it is also met with in cases of rupture of the intestine, and it may occasionally be observed as a symptom in gastric affections which do not prove fatal.

(10) A remarkable feature in connection with the horse's stomach is that true gastric juice, *i.e.* acid and pepsin, is secreted only in the fundus of the organ; at the pylorus pepsin alone is secreted. The area of the secreting surface in the fundus has been estimated as about one square food

(11) The movements of the stomach consist of waves of peristalsis which travel from the middle of the organ towards the pylorus, they become stronger as digestion proceeds, and their function is to direct the peptonised ingesta to the pylorus. These movements are excited by the presence of food, and also by any irritation of the gastric mucous membrane. These movements, as we shall point out later on, are of the greatest importance in connection with disease of the organ. According to Smith, churning movements do not occur in the stomach of the horse.

(12) *The Nerves of the Stomach.*—As nerve ganglia are present in the gastric walls, the stomach must be regarded as an automatic organ. These ganglia communicate with the vagi and sympathetic nerves. The vagus is the motor nerve of the stomach and it also supplies the gastric blood vessels with dilator fibres. The Sympathetic is chiefly inhilitory in its action, and it supplies the blood vessels with constrictor fibres. The result of paralysis of the stomach is that no ingesta can pass to the intestine, and as vomiting does not occur under ordinary circumstances a very serious and often fatal condition may ensue.

There are other important points in connection with the physiology of digestion in the horse which have a distinct bearing on our subject.

The importance of thorough mastication of the food is recognised by every practitioner, and the anatomical arrangement of the molar teeth of the horse indicates that their function is to properly prepare the food for gastric digestion.

Another interesting point is that the horse immediately after feeding is capable of doing moderately fast work without apparent injury. Not that such a course

is advisable; in fact a proper period of repose would be indicated after feeding, but the fact remains that a cab-horse may, immediately after feeding, be called upon to do a journey and does not appear to suffer from indigestion such as would be likely to occur in human beings and other animals if called on to exert themselves after a full meal. Probably some amongst you who have studied the question may be able to offer a satisfactory explanation of this matter. Some authors say that the small size of the stomach will account for this peculiarity in the horse, but this in itself will not satisfy an enquiring mind.

I shall next direct your attention to those gastric affections which are most commonly met with in practice. We may divide these into two groups.

(1) Those of a more or less simple nature, being functional disorders not showing acute or serious symptoms, and being generally amenable to treatment.

(2) Affections of a serious nature, showing acute symptoms, abdominal pain, marked constitutional disturbance a variety of attitudes and postures, and frequently fatal in their results.

Indigestion. In the first group we naturally place what is termed indigestion or dyspepsia. Now indigestion is a very popular term, as applied both to animals and to man. In the latter it has given greater scope for the patent medicine manufacturers than any other class of disease. Of so much interest and important is the stomach to man that it is said the Chinese form of salutation when translated into English means—"How is your stomach? Of late years we find that many of our clients have got it into their heads that indigestion is also an affection of frequent occurrence in horses, hence the stomach of these animals receives more popular attention than formerly. As a result the teeth are regarded as requiring constant supervision, and no treatment is considered perfect or complete that does not include the diligent use of the tooth rasp.

At one time the kidneys were regarded as the seat of every disease, but the old order has changed, and now the equipment of most stables includes a liberal supply of Epsom salt and bicarbonate of soda to improve digestion, while condiments have become a veritable craze with horse owners. Although admitting that indigestion is an affection by no means uncommon in the horse, I am perfectly certain that its existence has become a fad with many horse-owners, and if more attention were paid to ensuring a rational system of feeding, and less to drugs and condiments, these affections would be seldom met with.

Interference with normal digestion depends on a variety of conditions, and the difficulty in ascertaining which portion of the mechanism of the process is at fault renders the rational treatment of the affection anything but simple. The nature of the horses diet being simple, as compared with that of the dog or of man, of course renders the equine less liable to indigestion.

But we know that under the following circumstances the affection may occur in the horse, viz., long fasts, irregular periods of feeding, damaged food, an excessive amount of food, an insufficient allowance of water, and want of exercise in some cases. Again, the food supplied may be unsuited to the requirements of the animal, or the diet may be suddenly changed, and so cause disturbance of the normal process of digestion. Dental irregularities, interfering with proper mastication, may be an exciting cause, also a debilitated condition of the stomach which may result from an attack of influenza. As already remarked the affection known as indigestion may depend on a variety of conditions. such as functional disturbance of the nervous or vascular mechanism of the stomach, these lead to alterations in the amount and character of the gastric secretion, interference with the normal movements of the organ, and irritation to a greater or less degree of the gastric mucous membrane.

This irritation if continued, often leads to a condition of chronic gastric catarrh, in which case the dyspepsia becomes chronic. As might be expected, when gastric digestion is not properly carried out intestinal digestion must also suffer, and it is highly probable that recurring attacks of intestinal colic depend on this cause. The products of imperfect digestion when absorbed by the intestine are believed to exert an injurious effect on the system, and this accounts for the lack of vitality which animals suffering from dyspepsia display.

The Symptoms of dyspepsia are by no means constant. The animal is dull, out of condition, the appetite capricious, the skin in that state known as "hide bound"

When excessive acidity is present he will crave for alkaline substances, and lick the walls of the stable, or eat clay when opportunity offers. In some instances the appetite becomes depraved, and he will even eat his own excreta. The acid condition of the stomach does not always depend on an excess of acid secreted, but is often due to acids arising from imperfectly digested food. Among other symptoms observed are a sour pasty condition of the mouth, congestion of the buccal membrane, thirst, a dry cough, irregular action of the bowels, the excreta being excessively fœtid, and containing undigested oats. Alterations in the character of the pulse are by no means infrequent, and attacks of vertigo or megrims may be sometimes met with as the result of reflex irritation. Horses in good condition, too highly fed, and not getting sufficient exercise, may suffer from temporary attacks of dyspepsia.

We have no means of knowing whether horses experience the subjective sensations induced by dyspepsia in the human being, viz., depression, a sense of fulness in the gastric region, not amounting to actual pain, and great irritability of the nervous system and inaptitude for work.

Chronic Gastric Catarrh.—In cases that become chronic it is probable that chronic gastric catarrh is present, but beyond an aggravation of the symptoms mentioned, there are no evidences by which we can recognise this condition.

Temporary Gastric Catarrh.—In some instances, uneasiness not amounting to actual pain may be observed after feeding, and you are all familiar with those cases in which without apparent cause horses refuse all food for a few days, and suffer from nausea; probably a temporary gastric catarrh may account for such.

An abnormal appetite may be present in some cases of indigestion, the horse eating his bedding as well as his ordinary food. In cobs and ponies especially, this form is met with, and such animals often become affected with chronic cough and broken wind which probably have their origin in abnormal gastric digestion and disordered innervation of the gastric walls, leading to asthma or pulmonary emphysema by reflex action.

During convalescence from acute respiratory affections and influenza, we are aware of the evil effects produced by allowing a liberal quantity of food, when appetite returns. The stomach, in common with other organs, is in a debilitated condition, and unable to digest a full meal, hence it becomes more or less distended, and we find the patient that hitherto was progressing favourably, showing quickened respiration, a disturbed pulse, and loss of appetite. When proper attention is not paid to dietetics in such instances, serious symptoms may develop, and even fatal results.

In the treatment of indigestion or dyspepsia, there are some general principles which apply to all cases. The first of these is to ensure that mastication of the food is properly carried out. A proper examination of the teeth is necessary, and dental irregularities should receive

attention. The examination should be carried out by means of a mouth-gag, otherwise an offending tooth may escape detection.

Attention to the food is the next essential, with reference to quantity, quality, times of feeding, etc., a proper supply of water being also an important essential. Now attention to these details is of first importance, treatment by drugs being a secondary consideration.

Except in debilitated cases, it is advisable to commence treatment with the administration of a purgative, such as aloes and calomel, so as to clear out the alimentary canal. In cases where drastic purgatives are contra-indicated small doses of Epsom salts may be given in the food or drinking water.

There is very often difficulty in ascertaining the exact pathological condition of the stomach that is present, hence the prescribing of suitable medicinal agents is not an easy matter. In many instances there are evidences of excessive acidity, and the administration of alkalies with bitter tonics give good results. If the appetite be fair, a combination of soda bicarbonate, nux vomica, and gentian, may be given twice daily in the food. If, however, the appetite be in abeyance, it will be necessary to give the medicinal agents in the form of bolus, or in a drench. Many cases, however, do well by simply giving the soda bicarbonate in the drinking water.

No hard and fast rule can be laid down for treatment, as in some cases there may be a deficiency in the normal amount of acid in the gastric secretion, and the administration of dilute hydrochloric acid or nitro-muriatic acid succeeds when the alkaline treatment fails. Indigestion should properly be regarded as a symptom, or series of symptoms of various abnormal conditions of the stomach. Of course we must recognise the fact that indigestion may also be of intestinal origin.

In cases of the affection occurring in debilitated conditions of the system, I have found the milder preparation of iron of value, such as the carbonate or the ammonio-citrate, or citrate of iron and quinine, these may be combined with nux vomica and the combination restores nerve power to the gastric walls.

Indigestion in the Foal is commonly met with in country practice, and is very often due to the pernicious custom of working the dam, while rearing a foal. The young animal is thus left without food for long intervals, and when the mare returns, more milk is ingested by the foal than the stomach can digest, hence the result is indigestion usually evidenced by diarrhœa. Moreover the milk itself is altered in character in the mare's udder, and is rendered less easy of digestion.

The rational treatment consists in leaving mare and foal together. A laxative such as castor oil is then given to the foal, and if, after this has acted, the diarrhœa persists, astringents are indicated. I have found a mixture containing bismuth and pepsin useful in such cases. The administration of alkalies such as soda bicarbonate to the dam is said to prove beneficial in persistent cases. In more severe cases a mixture containing chlorodyne and chalk will be required, this should be given with port wine and starch or flour gruel.

The next point to which I desire to direct your attention is—*Does spasm of the stomach occur in the horse?* Spasm of the intestine is well known under the term of colic, although no one can state definitely the exact condition that gives rise to the symptoms, as colic *per se* does not cause death.

While admitting that spasm of the stomach may occur in the horse, I am not aware of any diagnostic symptoms by which it can be differentiated from intestinal colic. Probably it is usually diagnosed and treated as the latter affection, without detriment to the patient or to the reputation of the practitioner.

It has been said that if pain occurs soon after feeding its origin is in the stomach, but as spasm of the stomach *per se* is not likely to kill any more than spasmodic colic, I fail to see how this dogmatic assertion can be proved.

Under the heading of group II. I shall draw your attention to the following affections of the stomach of the horse:

(1) Gastric impaction.
(2) Acute gastric tympany.
(3) Rupture of the stomach.
(4) Gastritis.

Now owing to some of those physiological peculiarities of the stomach to which I have already alluded, gastric impaction and acute gastric tympany are very serious affections, and frequently prove fatal.

The diagnosis of these affections is attended with the most marked difficulties, and as I shall endeavour to show, it is only by attempting to recognise their existence that we can hope to adopt treatment which is likely to give any relief. Unfortunately, in consequence of diagnostic symptoms being absent in many cases, their true nature is often not revealed until an examination after death is made.

Again, symptoms may be present which are common to several affections both of the stomach and intestines. As our attendance is not always requisitioned in the early stages we have not an opportunity of observing the early symptoms, and too frequently we are called in the later stages when symptoms due to complications are present, and when therapeutical measures are difficult to prescribe, and the chances of a successful termination are remote. We must also consider that one gastric affection may be complicated with another, thus tympany may be associated with gastric impaction, and gastritis may also occur in connection with the latter affection, while a condition of chronic gastritis may predispose to both disorders.

Gastric Impaction.—In this condition the stomach becomes distended with solid ingesta, digestion is arrested, and in severe cases the walls of the organ are paralysed, the pyloric orifice contracted, and the communication between the stomach and intestine occluded. Boiled foods are regarded as the chief source of this affection. Requiring little or no mastication they are rapidly swallowed, especially if the horse has had a long fast and hard work, or is a greedy feeder, or is unaccustomed to this form of food. Green succulent food may have a similar effect, also boiled potatoes. But we meet with cases fed on every kind of food, both in town and agricultural horses. In the latter, during threshing time, horses may be hard worked, and it is not uncommon to feed them on oats in the sheaf in unlimited quantity, hence we meet with cases at the time of harvest in country practice.

Now impaction of the stomach varies in degree, and what is very important to remember is that it may be complicated with tympany of the organ, in which case the symptoms become altered and the gravity greatly increased. Indeed most authors describe both tympany and impaction under the same heading, but I think that in many cases at least it is possible to differentiate the affections.

The knowledge gained from autopsies leads one to believe that in many instances the affections are distinct as regards the altered condition of the stomach, although the causes may be similar.

As regards the exact manner in which gastric impaction occurs we have no definite evidence. We know that when the feed is finished, the passage of ingesta from the stomach to the duodenum is very slow; probably the effect of un-masticated food in an unfit state for gastric digestion sets the entire nervous and secretory functions of the organ in disorder. At any rate we

know that the affection is a serious one, as it may lead to rupture of the stomach, or to fatal nervous complications unless relieved.

The symptoms of gastric impaction vary, thus in some cases if tympany be present in addition, pain and distress are manifested. In others cerebral symptoms, probably depending on reflex action from the stomach, predominate.

As often happens the nervous symptoms may mask the abdominal. In such an instance the animal within a variable period after feeding, has a sleepy appearance, a staggering gait, a tendency to push his head against the manger or surrounding objects, in some cases stertorous breathing is present, and tremors of the superficial muscles are observed. The older authorities termed this affection "stomach staggers," but in the present day this term is loosely applied to various conditions independent of gastric impaction. To this point I shall refer later on.

The abdominal symptoms are not usually well marked, slow pain is manifested by uneasiness, pawing, frequent change of posture, and if the animal lies down he does so carefully. In the later stages, tympany may develop, and more violent symptoms are presented. Tympanites is usually slight during the earlier stages.

In cases of uncomplicated impaction attempts at vomition seldom occur, nor are eructations of gas observed. We usually find great difficulty in the administration of medicines in the form of drenches, and some of the fluid may be returned through the nostils. Unless relief be afforded, acute tympany may develop, and rupture of the stomach may result, or death may occur from exhaustion and from convulsions.

In the treatment of gastric impaction the indications are clear. (1) To adopt measures to evacuate the mass of ingesta from the stomach. (2) To restore nerve tone to the gastric walls, and to restore the process of digestion to a normal condition.

Now to fulfil the first indication the administration of a full dose of aloes in the form of bolus is often advised. In mild cases this may succeed, but when the impaction is severe we have to consider the fact that the bolus will not get beyond the stomach, and so will fail to act. It is far preferable to give the aloes in solution, combined with linseed oil and a full dose of oil of turpentine. I have frequently omitted the aloes, and given instead two drachms of calomel, with four ounces of oil of turpentine and two pints of raw linseed oil. In a few hours this may be followed up with a dose of tincture of nux vomica and carbonate of ammonia. If pain be a prominent symptom, or if evidences of nervous excitement be present, one ounce of chloral hydrate may be given in solution. Some authors believe that chloral hydrate exerts an antiseptic action in the stomach and checks fermentation.

Obviously, opiates in any form should not be given, as they tend to increase the paralysed condition of the stomach. The employment of physostigmine deserves consideration in these cases. In my experience it has no effect on the gastric condition, and I should imagine that if it were to act energetically on the walls of the stomach the tendency to rupture would be increased. However, your experience and observations on this point will prove extremely valuable and interesting.

Excitement and convulsive struggling may be present in some cases, and with a full pulse, injected visible mucous membranes and a plethoric patient, the value of venesection may be considered. Never having employed it in such cases I cannot offer an opinion as to its utility.

The term "Stomach staggers" is one concerning which there is considerable scope for discussion. Thus it is applied to conditions in which a staggering gait is a characteristic symptom, also to cases in which more marked nervous phenomena are present, such as delirium and convulsions, also to cases of gastric impaction, in which cerebral symptoms predominate. A careful review of clinical histories and of autopsies, and of the information contained in text books, leads me to believe that there are cases variously termed "encephalitis," "phrenitis," "meningitis," etc., which have no connection with gastric impaction, and whose origin very often is obscure.

On the other hand, there are cases in which without doubt gastric impaction is the exciting cause, and, as I shall point out later on, gastritis is often found at the autopsy of these acute nervous affections.

The condition known as "Grass staggers" is by some authors included under the heading of gastric impaction, but the late Professor Robertson regarded this as a special affection, due to the ingestion of rye-grass, which at a period when it is commencing to ripen developes a toxic principle capable of exerting special actions, especially on the spinal cord, but also on the cerebrum. Other authors attach much importance to the action of rye-grass in this direction, but while not denying its influence I have only to remark that in my experience of gastric affections complicated with nervous phenomena rye-grass was not used as feeding, and so could not be regarded as a cause.

In that peculiar affection termed "Vertigo" or "Megrims," there is no doubt that in some cases, at least, disorder of the stomach predisposes to an attack. In many cases the administration of an active cathartic, and attention to diet, may prevent a recurrence for a long period.

Gastric Tympany.—In this affection the stomach becomes distended with gases, the result of excessive fermentation of the ingesta. This distension varies in degree, and in some cases the stomach becomes of an enormous size. As previously mentioned, tympany can occur in conjunction with impaction, but it is probable that if the latter be present to any extent, the occurrence of the former would lead to rupture of the organ. Occasionally we meet with cases in which the autopsy shows a large amount of ingesta and excessive tympany, and we cannot but express surprise that rupture had not occurred. Gastric tympany was described by Percivall in his Hippo-Pathology, and in years later attention was drawn to the affection by General Smith, and by Mr. Caulton Reeks.

Similar causes may produce impaction and tympany, and it is difficult to explain how in one case impaction will occur, and in another tympany. Although green succulent foods are credited with being an important cause of the latter, I have met with it in stable-fed horses in which no green food was allowed. And I have encountered cases in agricultural horses in which roots, such as raw mangolds or boiled turnips, entered largely into the dietary.

With regard to the symptoms of gastric tympany, I may remark at the outset that while in some cases there are suggestive evidences of the presence of the affection, in others these are absent, and the diagnosis arrived at may prove to be erroneous. Attempts have been made to place the diagnosis of this affection on a satisfactory basis, but clinical experience teaches that the rules suggested for eliminating errors in this direction too often prove to be delusive.

The early symptoms we seldom see, but from enquiry we ascertain that they consist of dull abdominal pain, manifested by pawing, uneasiness, etc., on our attendance we usually find the animal attacked by fits of violent pain, greatly respiratory distress, profuse sweating, and a tendency to move about the stall in a semi-delirious manner. A varying degree of tympanites is present, in some instances this may be extreme, as the intestines may also be distended with gases. Usually the animal takes care in lying down, and makes many attempts before assuming the recumbent posture, but he

seldom remains long down. A posture which is very frequently assumed is that of "sitting on the haunches" like a dog. This appears to give temporary relief, and is frequently adopted during the course of the affection. Or he may lie on the sternum with the fore-limbs extended for a very short time. Slight eructations of gas may occur from the nostrils, also a slight trickling of fluid ingesta.

In cases where a certain amount of impaction is present as well, actual vomition may occur. And this, in the absence of marked constitutional disturbance, may be regarded as a favourable symptoms. But in extreme cases of gastric tympany there is neither eructation of gases, nor trickling of fluid ingesta, as the cardiac orifice is tightly contracted.

The pulse during the later stages becomes quick and weak, and delirium is well marked. Death may occur either from rupture of the stomach, or from convulsions and exhaustion.

The difficulties in diagnosis are readily appreciated when one considers that the symptoms are common to other affections. Of course eructations of gases and trickling of fluid ingesta are suggestive of a gastric affection, but these, as already remarked, are absent in extreme cases. "Sitting on the haunches" may be a symptom of intestinal calculus, rupture of the intestine, or rupture of the stomach. Again, twist of the double colon and gastric tympany are said to possess many features in common, and one has been mistaken for the other. In the less severe cases, an enquiry into the time of feeding, the nature of the food, the presence of eructations of gases, the symptom of "sitting on the haunches," the absence of grave alterations in the character of the pulse, and of grave constitutional disturbance, will probably lead to a diagnosis of gastric tympany.

It is said that the presence of tympanites on the left side, well forward, is suggestive of gastric tympany, but I have not found this phenomena present. I have observed marked resistance to the administration of fluid medicines, and a tendency for portion of these to be returned by the nostrils. Another point worthy of notice is that sedative drugs administered by the mouth, even in large doses, produce no effect.

In one case, the only symptoms observed were acute tympanites, dull continuous abdominal pain, constant straining, which was accentuated by rectal examination and by the administration of enemas. The autopsy revealed the stomach enormously distended with ingesta and gases.

It will thus be seen that I admit ignorance with reference to the diagnosis of this affection, and I shall gladly welcome any information on the subject. It is clear that successful treatment can depend alone on an early diagnosis; the longer the affection continues, the less are the chances of a favourable termination.

The indications for treatment are tolerably clear, but the method of carrying them out is often attended by considerable difficulties. These indications are to get rid of the gases which have accumulated in the stomach, to prevent recurrence, and to cause an expulsion of the gastric contents into the intestine. In ordinary cases, when treated sufficiently early, beneficial results are obtained from the administration of oil of turpentine, 4 ounces, strong solution of ammonia, 2 drachms, and raw linseed oil, 2 pints. Terebene may take the place of the oil of turpentine and often acts well.

Some may consider that the action of the ammonia is interfered with by admixture with oil, however this may be, the combination proves effectual. In ordinary cases, the evidences of improvement are the occurrence of eructations of gas from the nostrils, and the passage of flatus from the intestine. There seems to be little doubt that the oil of turpentine acts as an antiseptic, and has also the power of overcoming to some extent the muscular contraction of the pylorus, and stimulating the movements of the stomach.

In extreme cases there is the greatest difficulty in administering fluid medicines, and they are often returned by the nostrils. Indeed in such cases the violence of the symptoms renders the procedure not only dangerous but impossible.

As regards sedatives administered in the form of bolus or drench, experience teaches us that they produce no effect, as in consequence of the paralysis of the gastric walls they do not pass beyond the stomach, and we have the evidence already advanced that no absorption occurs from this organ in the horse. As regards the hypodermic injection of morphine, my experience is that in ordinary doses it fails to overcome the violent symptoms of pain, while if the doses are repeated or increased the excitement displayed by the horse becomes excessive, and the last state is worse than the first. In any case it must be remembered that opiates of any kind will tend to increase the paralysis of the gastric walls and to interfere with the peristaltic action of the intestines, and thus frustrate the object we have in view.

Some American and Continental authors have in such cases advised the passage of an india-rubber tube into the stomach, by way of the nostils, and when impaction is present as well, they advise washing out the gastric contents. Judging by my experience of these cases, I should be very much surprised if any practitioner could insert such a tube, in consequence of the excitement of the animal and the violence of the symptoms. Probably in ordinary cases such a procedure could be carried out, but these are the very cases in which medical treatment is likely to prove effectual.

It has been suggested by some authors to employ a long trocar and cannula, and to attempt puncture of the stomach from the left side. Directions are given of the various structures which are penetrated in the operation, which I shall not weary you with, but all I can say is that I should like to see the operation performed several times with success before attempting it myself. Judging by the displacement of the tympanitic stomach as witnessed at autopsies, I fear its location on anatomical land-marks would be a work of art.

If, however, marked tympanites is a leading feature in the case, puncture of the intestine should be carried out. It will relieve not only the pressure exerted on the pylorus, but also give a certain amount of relief to the animal.

As regards the employment of physostigmine in these cases, I seek for information. I am not aware that it produces its well known action on the walls of the stomach, and I should imagine that if it did so there would be grave risks of producing rupture of the organ. In those cases in which I have employed it, I did not observe any beneficial action to follow.

Mr. Caulton Reeks, in his work entitled "The Common Colics of the Horse," recommends a mixture of hydrate of iron and solution of hydrate of ammonia, prepared by mixing 1 ounce of sulphate of iron with 4 drachms of strong solution of ammonia in 2 pints of hot water. This mixture with its precipitate of hydrate of iron to be given in one dose. He considers that carbonate of ammonia is contra-indicated in this affection, as the chief gases present are carbonic acid, carburetted hydrogen, sulphuretted hydrogen, and a small portion of nitrogen, hence the action of the acid contents of the stomach on the ammonium carbonate would be to cause the evolution of carbonic acid gas, and so add to the amount already present. By the use of the agents advised, the solution of hydrate of ammonia will absorb the carbonic acid gas and form ammonium carbonate, while the freshly precipitated hydrate of iron will combine with the sulphuretted hydrogen present.

This treatment is to be followed up by the administration of terebene or oil of turpentine, and by a hypodermic injection of physostigmine.

Never having adopted the above treatment, I cannot speak as to its efficacy or otherwise.

If we are so fortunate as to relieve the distressing symptoms, it need hardly be said that the greatest care is necessary with reference to after-treatment, so as to prevent a recurrence. Soft easily digested food only being allowed in small amounts. This also applies to cases of gastric impaction.

Rupture of the Stomach. It will generally be admitted that the commonest cause of this condition is impaction of the stomach, complicated with tympany. Many observers have found that in cases where this lesion has occurred the gastric walls have not been in a normal condition. The influence of the *Oestrus equi*, in producing this abnormal condition is a debatable point, and time will not permit me to enter into a consideration of it. Other parasites also produce lesions in the gastric walls which tend to bring about rupture of the organs.

Whether vomiting occurs prior or subsequent to rupture of the stomach is also a point on which opinions differ. Probably it may occur under both conditions.

It is quite certain, however, that rupture may occur without the presence of vomition, and that well marked vomition may occur without the presence of rupture.

With reference to the diagnosis of rupture of the stomach, most clinicians agree that in some cases the symptoms are fairly characteristic, while in others there may be considerable difficulty in arriving at a definite diagnosis. The classical symptoms of this lesion are so well known that it is not necessary to specify them. The difficulty comes in when we encounter cases on the border line, so to speak, in which the pulse shows grave alterations, and the general appearance of the animal is anything but encouraging. Indeed, on more occasions than one I have made up my mind that rupture was present, but after events proved how erroneous was my opinion, for the cases recovered.

Of course if there are clear evidences of the occurrence of this lesion, it is not only useless, but adds considerably to the pain and distress of the animal, to administer medicines by the mouth. On the other hand, if the lesion is not present, and if the symptoms depend on the presence of gastric tympany, if we withhold the administration of active remedies we are not giving the patient a chance for his life.

I have seen cases in which the pulse could hardly be felt, with marked tenseness and hardening of the abdominal muscles, respiratory distress, and sweating. The animal almost immovable, the pain practically gone, the general expression of countenance haggard, and in such I decided that all I could do was "to smooth the path of death" by the hypodermic injection of morphine. But I was agreeably surprised to find some of these cases recover. On the other hand the presence of the lesion may not be discovered until an autopsy is held.

No doubt an opportunity for careful observation of the case is not always given, and if only a small rupture be present at the time of examination, the symptoms may prove deceptive. Obviously great discrimination is necessary in giving a definite opinion, in order to steer clear of the unpleasant consequences of errors of judgment in such cases.

An important point for consideration is, whether the movements of the animal induced by pain, such as rolling, etc., contribute to the occurrence of rupture of the stomach. Most authors believe that such movements do have an influence in this respect, and advise the adoption of measures to prevent the animal from throwing himself about when suffering from a gastric affection. In my opinion such measures should be carried out if possible, at the same time I must admit that in these affections the animal takes care in lying down, as a rule, and that the violence of the symptoms is chiefly manifested when he is on his feet. I do not see any reason why we should interfere with the animal assuming the posture of "sitting on his haunches," this gives him relief in gastric tympany, and so far as I can judge does not increase the tendency to rupture of the organ.

Amongst other points of interest in connection with rupture of the stomach, I may mention the influence which the vices of crib-biting and *wind-sucking* are believed to exert on the gastric walls. Although these vices appear to predispose to gastric affections, I have never observed that wind-suckers or crib-biters were more liable to rupture of the stomach.

Some authors state that horses suffering from "broken wind" are liable to an attenuation of the gastric walls, which predisposes to rupture, this certainly has not been my experience.

Acute Gastritis.—Is is generally admitted that acute gastritis as a distinct affection, *e.g.*, not depending on the action of irritant poisons, is not of common occurrence in the horse. Of one thing we may be quite certain—that the diagnosis of the affection is attended with the greatest difficulty. Judging by the results of autopsies, it would appear that the affection is far less common than other gastric lesions, and certainly cases dying from acute gastritis *per se*, are rare. It is quite possible that many cases of uncomplicated gastritis recover, so that statistics of the frequency of the disease are difficult to obtain.

Many and varied are the causes given in some text books for this disease, such as recurring attacks of dyspepsia, the after effects of gastric impaction, damaged food, putrid water, also fodder infected by cryptogams, etc. It has been found to occur in connection with diseases such as influenza, and a hæmorrhagic form in connection with purpura hæmorrhagica is described.

As already remarked, the symptoms of gastritis are by no means diagnostic, they may consist of slow continuous pain, evidenced by constant pawing, uneasiness, looking towards the sides at intervals, partial sweating —especially on the region of the neck and shoulder, total loss of appetite, and dull expression of countenance.

I have met with a number of cases from time to time in which the affection was complicated with symptoms of acute meningitis, the abdominal pain being quickly succeeded by the animal going down, struggling in intermittent attacks of convulsions, and being unable to rise. These cases invariably died, and the autopsy revealed evidence of acute gastritis but very slight appreciable lesions in the nervous system. The cases occurred both in town and in country horses, and at some periods were more frequent than at others. I was never able to assign any cause for these peculiar cases; at any rate every autopsy showed acute gastritis, and as no irritants of any kind were given the condition could not be ascribed to the effects of these. An easy way to get out of the difficulty is to suggest "microbic infection," but until something more definite than this is discovered I prefer to admit that—I do not know.

Most text books, when describing the post-mortem appearances of acute gastritis, state that the mucous membrane is covered by a "layer of tenacious mucus." This, however, is a condition which occurs in the normal stomach of the horse.

Chronic Gastritis may occur as a sequel to an acute attack, or it may be induced by chronic indigestion. It is difficult, if not impossible, to differentiate the conditions of chronic gastritis from chronic indigestion, as one reacts on the other.

In the treatment of acute gastritis the indications are to remove irritating ingesta from the stomach by ad-

ministering a dose of raw linseed oil, and to allay pain and reduce the irritability of the gastric nerves by sedatives such as belladonna and sodium bicarbonate. Should the pain become acute, one ounce of chloral hydrate, well diluted with milk and mucilage may be given. Solid food should be avoided, and demulcent preparations, such as linseed tea, boiled oatmeal gruel, milk, etc., should be given instead. When meningitis occurs as a complication treatment is usually of no avail, and if full doses of chloral fail to give relief, I am of opinion that the most humane course to adopt is to have the animal destroyed.

I think it will generally be admitted that the more serious gastric affections are far less frequently met with in the present day than in the past. The veterinary supervision of large stables in the city will account for this, and the rational system of feeding which such supervision secures must be regarded as an important element in prevention. Such cases are, however, of comparatively frequent occurrence in country districts, as improper and irregular feeding, and delay in obtaining professional assistanee are the order of the day.

There are several other affections of the stomach, but time will not permit me to consider them. Fortunately they are not commonly met with, or perhaps I should say they are seldom or never diagnosed, nor is it possible to detect their presence during life. They may give rise to various symptoms, which may or may not be attributed to a gastric affection, while treatment, in consequence of the nature of the lesions cannot, at least in many of them, prove successful. Hence they may be regarded rather as pathological curiosities than as matters of interest to clinicians. Amongst these I may mention purulent gastritis, gastric ulcer, dilatation of the stomach, foreign bodies in the stomach, tumours of the stomach, etc.

In conclusion, I hope that I have succeeded in bringing before you sufficient pabulum for discussion. I believe this to be the chief function of an Essayist, and certainly with the audience that I have the honour to address this evening, I should be exceeding that function and assuming the character of the pedant were I to attempt the feat of instructing those who probably know far more about the subject than I do.

I must apologise for the crude manner in which the paper has been prepared, but I would plead the excuse that it was composed in moments snatched from the daily routine of a general practitioner's life. I have approached the subject from the point of view of the clinician who seeks for information, who, with a "judicious distrust and a wise scepticism," endeavours to distinguish facts from theories, and consequences from coincidences, and who recognises that—"The knowledge which a man can use is the only real knowledge, the only knowledge which has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like raindrops off the stones."

Discussion.

Mr. Wolstenholme had never seen a case of acute gastritis in the horse that was not due to some irritant poison. He saw no necessity to pass a probang through the nostril. He had long wished to hear ruptured stomach associated with cirrhosis of the liver discussed, for he had often seen these two conditions associated. He had often seen small ulcers covering the mucous membrane of the stomach. He would like to ask Mr. Wallis Hoare whether vomition occurred before or after rupture. In concluding he wished to express the great pleasure he had had in listening to Mr. Wallis Hoare's paper.

Professor Williams advocated giving medicine per rectum and considered that attention should be drawn to adulterated drugs. He failed to see how vomition could occur after rupture of the stomach.

Mr. Edwards had a case the previous day of tympany of the stomach. In that case he noticed particularly that the gas was passed through the mouth and not through the nostrils.

Mr. H. Sumner eulogised the paper. There was one condition which he considered of importance, and which had not been mentioned in the paper, and that was a distinct hypertrophy of the organ. To him there appeared to be no great distinction between impaction of the stomach and impaction of the colon, and in his experience he had recognised nothing which would lead him to differentiate these disorders. He had never observed catarrh of the stomach.

Mr. Stent said that what appeared to be peculiar in connection with some of these affections was that animals displaying similar symptoms during life frequently presented quite different results on post-mortem examination.

Mr. Hughes said that to him gastric diseases were exceedingly difficult to differentiate, particularly impaction and tympany. He endorsed the practice of puncturing the colon. Regarding vomition, he knew of one pony which had had three attacks, and worked for three years afterwards.

Mr. Mattison asked with reference to wind-suckers being attacked by gastric tympany, and whether it would not be possible to gain some knowledge of diagnostic symptoms by observation of such cases.

Mr. Wallis Hoare, in replying to the remarks of the various speakers, thanked the members for the kind attention and favourable reception given to his paper. He was pleased to find that all the speakers were in agreement with him as regards the marked difficulties in the diagnosis of gastric affections in the horse. This was in striking contrast to the views expressed by some individuals who fancied that they possessed special diagnostic skill in this direction, which was much in evidence in a discussion on the subject recently in the pages of *The Veterinary Record*.

As regards the employment of the probang or rubber tube in cases of gastric tympany, he quite appreciated the surprise of the President at the suggestion that the tube should be passed through the nostril and not by the mouth. But in an American work on Veterinary Therapeutics the author advises this method, but naively remarks that if you fail to pass the tube through one nostril, then try the other one. If failure occurs by way of the mouth there is no such alternative.

Judging from his experience in such cases, however, he would regard such an attempt at treatment as purely theoretical.

With reference to the diagnosis of gastric ulcer, he did not think that there were any diagnostic symptoms of such a condition.

Regarding rupture of the stomach and the occurrence of vomition, he once had a case in which the abdomen was punctured by a shaft, vomition occurred shortly before death, and the autopsy showed that the stomach had been ruptured by the shaft, thus showing that vomition may occur after rupture.

Replying to Mr. Edwards, he did not state that the symptom of "sitting on the haunches" was diagnostic of gastric tympany. But taken in consideration with other symptoms it was suggestive, and it was important to remember that this symptom was not to be regarded as a fatal one.

With reference to wind-suckers, he did not consider that such animals could take in wind in such quantities as to produce gastric tympany.

In conclusion, he had pleasure in stating that he had derived a considerable amount of knowledge from the discussion, and, as he had anticipated, this was of far greater value than the paper which he had read for them.

A hearty vote of thanks was accorded to Mr. Hoare.

Specimens were exhibited by Professor Williams, Mr. Price (of Tarvin), and Mr. Lewis.

DISEASES OF ANIMALS ACTS 1894 TO 1903. SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Rabies. Cases Confirmed.		Sheep Scab.	Swine Fever.	
	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Animals.	Dogs.	Other	Out-breaks	Out-breaks.	Slaughtered *
GT. BRITAIN. Week ended June 6	28	29			11	14			1	74	356
Corresponding week in 1907 ..	25	29			16	52			3	93	283
Corresponding week in 1906 ..	14	14			22	43			..	19	91
Corresponding week in 1905 ..	20	25			27	44			5	20	113
Total for 23 weeks, 1908	556	736	8	112	360	1189			626	973	4535
Corresponding period in 1907 ..	550	748			420	1007			393	1138	5410
Corresponding period in 1906 ..	464	692			498	935			282	549	2822
Corresponding period in 1905 ..	487	687			548	982			641	857	1718
Board of Agriculture and Fisheries, June 9. 1908.											
IRELAND. Week ended May 30	..	..	..	..	..	..	..	..	1	13	136
Corresponding Week in 1907 ..	..	..	..	..	..	..	..	..	1	1	62
Corresponding Week in 1906 ..	..	..	..	..	..	..	..	..	1	2	15
Corresponding Week in 1905 ..	..	..	..	..	1	2	..	..	1	2	21
Total for 22 weeks, 1908	4	7	..	..	..	..	..	..	261	93	1770
Corresponding period in 1907 ..	1	3	..	..	..	..	..	..	159	57	1035
Corresponding period in 1906 ..	2	2	..	..	3	10	..	..	141	31	452
Corresponding period in 1905 ..	2	2	..	..	10	27	..	..	216	30	350

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, June 3, 1908.

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

Alleged Diseased Meat at Winchester.

At the City of Winchester Petty Sessional Court, held at the Guildhall, on Friday, 5th inst., Mr. Tom Hobbs, a butcher and meat contractor, of Southampton, was summoned at the instance of the local authorities for being in possession of unwholesome meat for the purpose of sale and intended for the food of man.

Great interest was taken in the case, the defence being conducted at the instance of the National Federation of Meat Trades Association, Mr. Payne, the secretary, being in Court during the protracted hearing.

Mr. Ernest B. Charles appeared for the prosecution, whilst Mr. Clarke Hall was for the defence.

Defendant pleaded not guilty.

Mr. Charles, in opening, mentioned that the meat in question had been delivered by Mr. Hobbs, who held the contract with the War Office at the Rifle Depôt at Winchester. It was a clear case, and, he further submitted, a bad one. On May 5th, at 11 o'clock, the meat was delivered. In consequence of information he had received, the Director of Supplies to the Army sent Mr. Knowles, a meat expert, to Winchester to examine the consignment. The meat was found to be unfit for food, and it was afterwards seen by the inspector of Winchester and condemned by the magistrates. As the Bench were aware, these difficulties arose from time to time, and indeed, did a little while ago with regard to another contractor at Southampton. The meat was found to be unquestionably bad, unquestionably unwholesome, and unquestionably unfit for food. Mr. Hobbs was informed, and subsequently saw the meat, and on the following day brought several experts to examine it. The evidence would show that the meat was from an old and emaciated cow, the udder having been removed. The tissues were inflammatory and the meat was slimy and sloppy. The only gland that remained was full of matter, whilst there was also a tumour. That was the meat which Mr. Hobbs was going to endeavour to persuade the Bench had been wrongfully destroyed, and that it was meat of which he was not ashamed and was fit for the food of man.

Mr. Frank Knowles, meat expert to the War Office, said he examined the meat, which consisted of two fore quarters, one hind quarter, and what in the trade was called a top piece. It was from an old cow and of very poor quality. It was wet and the flesh had not set. He sent for the Medical Officer of Health for Winchester and for Mr. Lord, the inspector, and a closer examination was made. There was then found to be a growth inside the ribs, and a liquid ran out when it was cut. The fat was yellow, and the tissues were of a spongy nature. The glands had been taken out before the meat was sent, that fact alone being good reason to create suspicion.

Cross-examined by Mr. Clarke Hall: He had no certificated qualifications as regarded the examination of meat, but had had much practical experience, having been in the trade all his life. Sometimes udders were removed, but in this Army contract there was a stipulation that the udder should be left in. There were a number of glands remaining inside. He did not see sufficient of the animal to decide whether it was tuberculous. He did not describe the meat as tuberculous. Colour of fat often depended on the breed of the animal. He advised the rejection of the meat because it did not comply with the terms of the contract, which, in the case of cow meat, stipulated that the cow should not have been more than four years old, whilst the meat in the instance was from a cow about eight or six years. The removal of the udder was in itself sufficient reason for the rejec-

tion. On May 18th he advised the War Office to reject two loins on the ground that it was ram mutton instead of ewe mutton, it was true that a loin was sent back to him as being ewe mutton, but he could not say whether it was one of the two which he had condemned as ram mutton.

By the Bench: He rejected the meat because it was not "good and well fed."

Dr. Sandilands, the Medical Officer of Health for Winchester, said that in the right fore quarter there was a swelling in the pleuro tissue at the seventh rib. The swelling was circular in shape and about 3 inches in diameter and three-eights of an inch in thickness. The surrounding pleuro membrane was wet. The superficial muscles of the flank were impregnated with serum and the flesh was spongy and could be gripped between the fingers and moved freely over the underlying ribs. The left hind quarter was extremely deficient in fat. The kidney was moveable and only a thin layer of adipose tissue was found in the capsule of the kidney. The tissue at the base of the udder was wet and slimy. The sub-peritoneal tissues were impregnated with serum. The surface of the peritoneum was wet. The right fore quarter and the left hind leg were both deficient in fat, the flesh being watery. The deficiency in fat and the fact that the flesh was flabby instead of firm and dry led him to the conclusion that the meat was unsound and that the carcase was from an animal emaciated by chronic disease or old age.

Cross-examined: He had no veterinary qualifications at all. With his present knowledge he said the animal was tubercular. He did not find that as the result of his examination of the meat. He knew that twenty per cent of animals were tuberculous. Two had been condemned in Winchester, which, of course, would not be twenty per cent. The tumour might arise from many causes. external injury perhaps.

By the Bench: An animal would not necessarily be unsound because it was aged. If a beast were hurried to market and slaughtered the flesh would not set and might make the meat unsaleable.

Mr. Lord, the inspector of nuisances, said the first thing he noticed was that the glands had been removed. He discovered a growth in the pleura surrounded by inflammatory tissues.

Cross-examined: One reason why he condemned the meat was that it had not set.

Mr. Clark Hall: What, does wet flesh indicate that there must have been disease?—There are many complaints which would result in the meat being wet.

Dr. Thursfield, senior demonstrator in pathology and bacteriology at St. Batholomew's Hospital, spoke to having examined some pieces of the meat. There was a tumour like formation which gave evidence of disease. The dense fibrous tissues were tuberculous, with giant cells. He formed the opinion that those appearances were due to infection with one or two possible parasites —the tubercle bacillus and what was commonly known as the ray fungus. He therefore got flesh sections and used the proper measures to demonstrate the tubercle bacillus and ray fungus. He was unable to find the ray fungus and he therefore came to the conclusion that the lesion in question, the tumour like formation, was due to the action of the tubercle bacillus.

Mr. Charles: You found it impossible to isolate the tubercle bacillus. Is that unusual?—Not at all.

By the process of elimination you are thrown back upon the conclusion that the diseased condition was tubercular?—Yes.

Mr. Clarke Hall: You failed to detect the presence of tubercle at all?—Yes.

You did not actually find any of the bacilli of tuberculosis?—No.

You found no tubercle in the swelling or the tumour?—No.

Have you ever before examined an animal in which the animal had tubercle and a tumour, and there was no trace of tuberculosis in the tumour?—Yes, in the guinea-pig.

By the Bench: If tuberculosis affected one portion of an animal it would not necessarily affect the rest, or permeate the whole of the carcase.

The Defence.

After other evidence for the prosecution, Mr. Hobbs was put into the witness-box. He said he had been in business for 22 years. He personally inspected all cattle and purchased direct. This particular animal came from Mr. Mullett, of the Isle of Wight, and it was one of 18 which he bought. Some were Jerseys and Guernseys, and all were perfect and sound. If he ever had any suspicions about an animal he always called in the Inspector at Southampton. On several occasions he had voluntarily surrendered animals. When he heard of the seizure in this case he got three or four butchers from Southampton to come with him to inspect the meat. At Winchester he found that the meat was put in an unventilated room beneath that Court. The animal was killed between 5 and 6 o'clock on Monday evening, the day before the seizure. It was sent with others in a covered van from Southampton. He denied that the meat seized was wet. The weather was wet, and owing to that and also to the journey the meat had not set properly. The high colour was due to the breed and was a characteristic of such animals

By Mr. Charles: The meat was not wet or slimy. He saw no sign of any tumour. With regard to the udder he was often asked to remove it because it was very fat. It was not an emaciated cow. He had evidence that the meat was not slimy and filthy.

Mr. Hobb mentioned that since this incident he had secured the Army contract for the camp at Salisbury Plain.

Mr. James Hobbs, brother of the defendant, said he delivered the meat to the barracks.

Mr. Harry House, Mr. Hurley, Mr. Foster, all butchers from Southampton, gave testimony to prove that the meat was quite good.

Mr. Albert Wendon, who killed the animal, denied it was bad. So far as he could tell it was perfectly healthy.

By Mr. Charles: He had been in the trade all his life. He saw no tumour, he had seen a fatter cow.

Mr. Mullet, who sold the cow, declared it to have been a perfectly healthy animal.

Mr. Alfred John Hunt, Inspector of Food for Southampton, said he frequently visited the premises of the defendant at Southampton.

Cross-examined: He did not happen to visit the premises on May 4th.

Mr. William Della Gana, a Member of the Royal College of Veterinary Surgeons, of Southampton, said he came to see the meat that had been condemned. He made a careful examination but could find nothing to indicate an unsound condition at all. The meat was in a fair condition, but it had not set. It was highly coloured, as was the case with beasts from the Channel Islands. He did not notice that it was wet. To use the trade term, he would say that it was sweating, that being due to the fact that it was then being kept in a place without any ventilation. The meat gave him the impression that it had been knocked about. He saw no evidence that the glands were unhealthy, and cut some and sent them to Sir John M'Fadyean. He saw no tumour—which seemed to have developed during the evidence. (Laughter.)

By Mr. Charles: Bacillus was the animal itself and histological tubercle was the district in which it lived.

If a person in the position of Dr. Thursfield found histological tubercle in conjunction with giant cells, do

you not think it was likely?—Bacteriology and pathology are very frequently matters of opinion.

By Mr. Clarke Hall: The deep tissues were fairly normal. The exterior ones were wet, indicating exposure to the air. Serum was the liquid portion of the blood—the blood minus solids. They would be bound to get some liquid if they pressed the meat hard enough.

Professor William Owen Williams, ex-President of the Royal College of Veterinary Surgeons, Veterinary Surgeon to H.M. the King, was the next witness. He had, he mentioned, made a life study of these subjects. On May 6th he went to Winchester to examine the meat. He cut into the deeper glands and made a thorough examination. It was good meat. He would pledge his reputation that it was healthy and fit for the food of man. The journey before the meat had been delivered of course would prevent it becoming hard and stiff. It needed a special knowledge of animals to be able to judge accurately of tuberculosis in animals. The more ignorant people were the more ready they were to give an opinion. As to the dropsical condition of the meat, he would mention that sixty or seventy per cent. of flesh consisted of water, and therefore they must not expect meat to be dry. The degree of moistness varied to a considerable extent. It was only a matter of degree. A damp day would prevent *rigor mortis* setting in. This carcase had not set. As for what had been referred to as the tumour, he saw a small piece of it had been cut. There might have been something there, but it could have been of no consequence because the surrounding tissues were perfectly healthy. There were no indications of disease in any part of the carcase.

By Mr. Charles: He could not believe that there had been a tumour the size of a man's hand.

The evidence of Dr. Thursfield showed that he found definite histological tubercles and giant cells. Would not that show a diseased condition?—It would show that there had been a little irritation.

What, will a little irritation produce histological tubercle?—Yes.

Addressing the Bench for the defence, Mr. Clarke Hall commented upon the alarming case that had been presented by Mr. Charles in opening, and maintained that nothing had been brought out to verify it. There was nothing to show that the meat was diseased. Certainly Mr. Knowles knew nothing of any disease about the meat and the whole case had resolved itself into a scientific discussion at an enormous length and in great detail. The case as to a deliberate attempt having been made to foist bad meat on the people had completely broken down. And so the prosecution argued that in spite of the evidence of witnesses that no tubercle was present, still there was evidence that one man found something in the nature of a tumour which he found to be tubercular. Now tubercular did not mean tuberculosis. There was all the difference in the world between the two words. Tubercular meant any injury to the flesh which raised a sort of nodule. Tuberculosis was a thing entirely different. Tuberculosis meant one of the most serious diseases to which man or animal were subjected. Anything inflammatory would set up something in the nature of what had been called a tumour. Of course, serum sounded terrible, but it only meant simply the liquid blood. There were corpuscles which were more or less solid, and serum, which was liquid. It was doubtful at the present time whether a man could be convicted if he had no knowledge or unless he had wilfully shut his eyes where he might have had knowledge as to unsoundness. It was for the prosecution to prove that the meat was unsound. In this case he contended that he had brought forward evidence to prove conclusively that the meat was not unsound. Mr. Knowles had admitted that the only reasons why he rejected the meat was because it was not in accordance with the War Office terms of contract. That was a matter for the War Office and Mr. Hobbs. Mr. Knowles was right and he did not complain of his conduct. With regard to the other witnesses there was a great conflict, but the balance was certainly in favour of the defendant. The points raised were of a scientific nature and no jury would be entitled to convict. No man should be convicted where the probabilities were dead against the possibilities of an animal having been tuberculous.

After a brief consultation, the magistrates found for the defendant, the Chairman remarking that it was a case in which they could not convict.

One of the magistrates, it was stated, dissented from the verdict, the other four being for the dismissal of the case.

Royal (Dick) Veterinary College—Appointment of Professor of Pathology.

Veterinary education in Scotland has taken a distinct step forward, thanks to the generosity of a former graduate of the Dick College, Mr. A. I. McCallum, J.P., M.R.C.V.S., who, by his magnificent gift of £15,000 has endowed a Chair of Pathology and Bacteriology in that school. The Chair having been duly advertised, the Board at their recent meeting appointed as the Professor, Dr. Gerald Leighton, F.R.S.E., who has held the position of lecturer on these subjects in the college for the past six years.

Dr. Leighton received his early education at Nelson College, New Zealand, entering Edinburgh University as a student and graduating there as M.B., C.M. in 1895. He spent some time in Professor Hamilton's pathological laboratory in Aberdeen, but owing to ill-health was unable immediately to pursue pathological work, and accordingly spent several years in country practice in Herefordshire. During that time he devoted much attention to biological subjects and especially to the study of British reptiles, as the result of which he published his first book, "British Serpents," which has since ranked as a standard work on the subject. Returning to Edinburgh to take up scientific work entirely, Dr. Leighton spent some time in the Research Department of Zoology at Edinburgh University, during which time he published a companion volume to his first book, this time on "British Lizards." From his dual training in biology and pathology it was natural that he should turn his attention especially to comparative pathology, and in 1902 he took up the lectureship on those subjects at the Dick College in succession to Mr. Stockman. Since then he has had sole charge of the Pathological Department in the College. The new Professor is very well known as a lecturer and writer on biology and comparative pathology, and has published many papers on these subjects in various scientific journals.

ARMY VETERINARY SERVICE.

Extract from *London Gazette*,

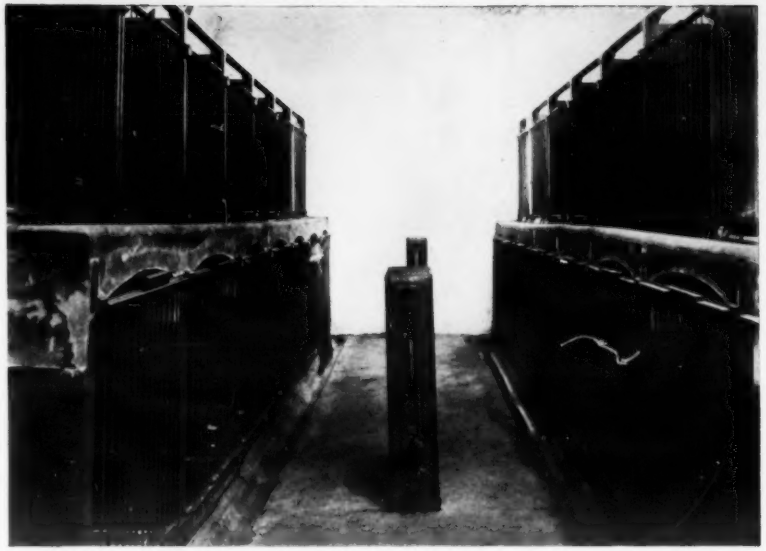
WAR OFFICE, WHITEHALL, June 9

ARMY VETERINARY CORPS.—Capt. F. H. Shore retires, receiving a gratuity. Dated June 10th.

His Majesty the King held a Levée on Monday, June 1st, at St. James' Palace. The following presentations to the King were made: . . . . . Vet.-Lieut. J. E. Still, Gloucestershire Yeomanry, by Inspector-General of the Forces.

Mr. J. BUCKINGHAM, of Harleston, Norfolk, and Mr. R. W. Knowles, of Wisbech, acted as Veterinary Inspectors at the Horse Parade held under the auspices of the Cambridge Horse Parade Society on Midsummer Common, Cambridge, on Whit Monday.

Dog Infirmary, for large dogs.



Dog Infirmary, for small dogs.

Horse Infirmary. Renovated Boxes in Middle Quadrangle.

Horse Infirmary. Renovated Boxes.